SURGICAL MANAGEMENT OF TRISMUS DUE TO ORAL SUBMUCOUS FIBROSIS - LYSIS OF FIBROTIC BANDS WITH THE KTP-532 LASER

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Abstract: *Oral Submucous Fibrosis is an insidious, chronic disease affecting the oral cavity, sometimes the pharynx and rarely the tongue. 15 patients with Oral Submucous Fibrosis presenting with severe trismus were treated with lysis of the fibrotic bands with a KTP-532 Laser and adjunctive treatment with excellent results over a 12 month follow-up period.*

Key words: *Oral Submucous Fibrosis; Trismus; Fibrotic Bands; KTP-532 Laser*

INTRODUCTION:

Oral Submucous fibrosis is a collagen disorder that affects the submucosal layer of the upper digestive tract. The major cause is the habit of betel quid chewing, which is common in Central, Southern, and Southeast Asia[1]. The progressive and irreversible course of disease results with trismus, dysphagia, xerostomia, and rhinolalia [2,3]. The most serious complication of this disorder is the development of oral carcinoma, and the incidence in different series varies from 1.9 to 10 percent [10].

A sufficient mouth opening can be achieved by complete release of fibrotic tissue, and if required, a coronoidectomy and temporal muscle myotomy. Reconstruction of the resultant defect is problematic and various methods have been described including split thickness skin grafts, Buccal Fat Pad(BFP) Grafts[4], Microvascular Free Radial Forearm Flap[5], Tongue Flap[6] and Nasolabial Flaps[7]. Local Injections of placental extract[8] and hyalase[9] have also been tried with varying effect.

All the above described methods of reconstruction are either prone to early recurrence of fibrosis or more importantly, in the setting of a pre-cancerous lesion, make regular monitoring of the affected mucosa for carcinomatous change difficult or even impossible. This study evaluates the efficacy of the Aura KTP-532 Laser (Laserscope) to release the fibrotic bands and other adjunctive therapy in the management of trismus secondary to Oral Submucous Fibrosis.

MATERIAL AND METHODS:

15 patients with Oral Submucous Fibrosis presenting with severe trismus were treated with lysis of the fibrotic bands with a KTP-532 Laser under general anesthesia with nasotracheal intubation. The patients were placed in the Tonsillectomy position and a Boyle-Davis Mouth Gag applied and fixed with Draffin Bipods. Fibrotic bands in the region of the Pterygo-Mandibular Raphe and Faucial Pillars were identified by sight and palpation (Figure 1) and a 'Z' shaped release done. (Figure 2). The resultant mucosal defect (Figure 3) was not grafted and allowed to epithelialize on its own. Post operatively, the patients were given intralesional injections of 0.1% Triamcinalone acetonide fortnightly for 12 weeks and advised active jaw stretching exercises with a spring loaded appliance together with a cessation of the betel quid chewing habit to prevent relapse. A long course of anti-oxidants was also prescribed. Patients were followed up for a period ranging from 12-18 months to assess recurrence of the trismus and response to treatment and relapses noted.

RESULTS:

Over a 30-month period, a total of 15 patients with Oral Submucous Fibrosis were treated at this center. All the patients were male and ranged in age from 20 to 56 years with a mean age of 29 years. The degree of trismus was assessed preoperatively and the interincisal distances ranged from 15mm to 31mm with a mean of 24.60mm. Post operatively, the patients were followed up regularly and assessed for recurrence of trismus and malignant change.

All patients were followed up for a minimum of 12 months. Interincisal distances were measured immediately post-operatively and at 6 and 12 months, and progress monitored. Immediate increase in the interincisal distance tend to reduce over the first 6 months and stabilized in the following 6 months. A mean increase interincisal distance by 12.60mm (54.63%) was noted at the end

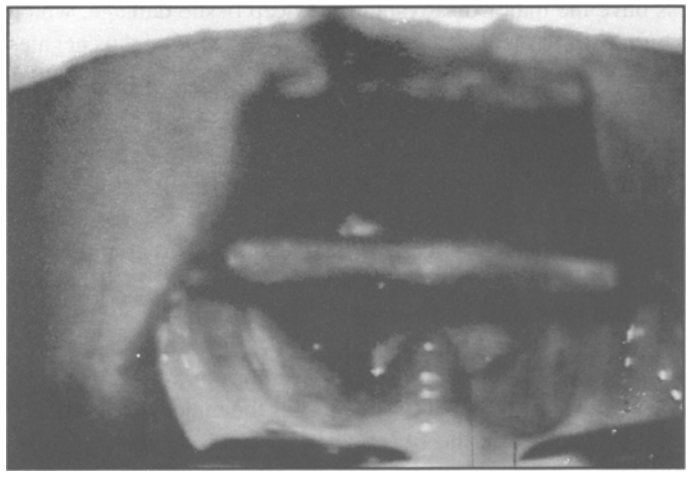

Fig. 1: Photograph of fibrotic band in the Faucial Pillar.

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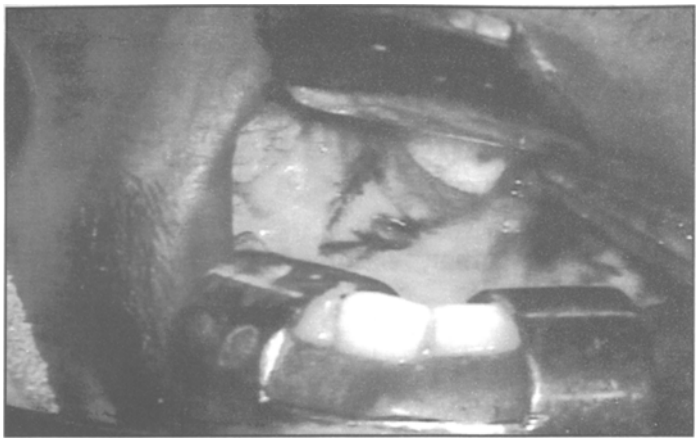

Fig. 2: Photograph of 'Z' Shaped release of fibrotic band with a KTP-532 Laser.

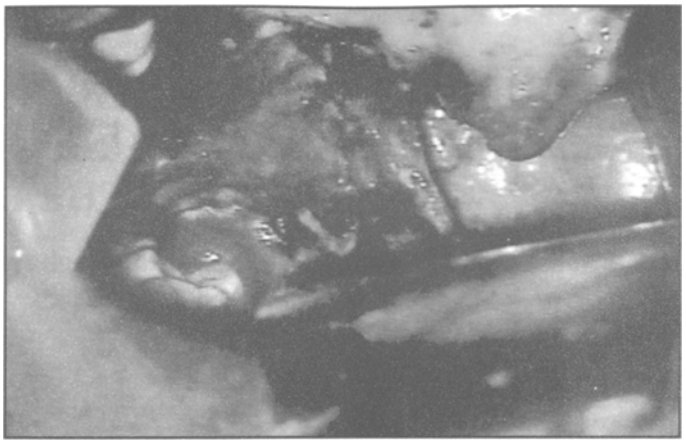

Fig. 3: Photograph of lasered area with resultant mucosal defect.

of 12 months. Complete epithelialization of the mucosal defects took place in approximately 2-3 weeks in all cases, and the duration was related to the size of the defect.

No major complications were encountered in this study. No case in this study progressed to malignancy during the period of the study. In 9 cases, nasotracheal intubation was effected by railroading the endotracheal tube over a 5mm flexible fiberoptic bronchoscope because of difficulty in visualization of the larynx.

DISCUSSION:

Oral Submucous Fibrosis is an insidious, chronic disease affecting the oral cavity, sometimes the pharynx and rarely the tongue. It is characterized by the progressive and abnormal sub-mucosal deposition of collagen in the tissues of the Palate. Faucial Pillars and the Buccal Mucosa with involvement of the latter sites leading to trismus.

Traditional methods of releasing the fibrotic bands with cold knife are associated with increased per-operative bleeding which is difficult to control in the pre of severe trismus. Moreover introduction of surgical instruments into the operative site is difficult.

Electro surgical techniques, though associated with reduced blood loss have the major disadvantage of deep tissue damage, which in turn leads to increased post operative fibrosis and thus negates the early gains achieved.

The KTP-532 laser is a visible laser with wavelength of 532Nm. It is obtained by passing a Nd-YAG laser beam through a crystal of KTP thereby doubling the frequency and halving its wavelength. This wavelength is selectively absorbed by blood vessels and hence this laser has excellent haemostatic characteristics. In addition, this laser can be delivered through a flexible fibre and hence can be delivered to relatively "difficult-to-access" areas.

Both of these are major advantages over the commonly available CO_2 laser. The KTP-532 Laser thus has the major advantages of being able to excise the fibrotic bands precisely with minimal collateral tissue damage and a bloodless field even in the presence of trismus. Minimal tissue damage with excellent haemostasis allows the raw area to be allowed to epithelialize spontaneously without any surface grafting. Moreover this procedure can be repeated if required.

The advantages of allowing spontaneous epithelialization of the mucosa are that the affected areas are easily visible for inspection and hence any malignant change can be detected at the earliest, whereas areas covered by bulky flaps might hide malignancies under them till they are relatively large.

Moreover utilization of regional or free flaps renders them unavailable in case they are required later for reconstruction of defects caused in the excision of overt malignancies that might arise there and makes repeat surgery much more complicated. Adjunctive therapy in the form of jaw stretching exercises and local intralesional steroid injections prevent the trismus from recurring. Abstinence from chewing the betel quid and antioxidant therapy delay progression of the disease progress and more importantly may prevent malignant change.

CONCLUSION:

The excision of fibrotic bands due to Oral Submucous Fibrosis with a KTP-532 laser with the above described adjunctive therapy has shown excellent results in the short term and has major advantages over other conventional surgical procedures. This is a new and hitherto unpublished use of this versatile tool which has great promise for the future.

REFERENCES:

1. *Canniff, H. The Aetiology of Oral Submucous Fibrosis: The Stimulation of Collagen Synthesis by Extracts of Areca Nut Int J Oral Surg, 1981 ; 10(- 1): 163- 167.*
2. *Joshi SG. Submucous Fibrosis of The Palate And Pillars. Ind J Otolaryng 1953; 4:110.*
3. *Lal D. Diffuse Oral Submucous Fibrosis. J All India Dent Assoc 1953; 26: 1 .*
4. *Yeh CJ Application of the Buccal Fat Pad to the Surgical Treatment of Oral Submucous Fibrosis. Int J Oral Maxillofac Surg 1996 Apr; 25(2): 130-3.*

5. *Wei FC, Chang YM, Kildal M, Tsang WS, Chen HC. Bilateral Small Radial Forearm Flaps For The Reconstruction Of Buccal Mucosa After Surgical Release of Submucosal Fibrosis: A New, Reliable Approach. Plast Reconstr Surg 2001 Jun; 107(7): 1679-83.*

6. *Golhar S. Mahore MN, Narkhede S. Tongue Flap In OSMF. Ind J Otolaryng 1988; 41: 104.*

7 *Kavarana NM, Bhathena HM Surgery for severe trismus in Submucous Fibrosis. Br J Plast Surg 1987; Jul; 40(4):407-9.*

8. *Katharia SK, Singh SP, Kulshreshta VK, The Effects Of Placenta Extract In Management Of Oral Submucous Fibrosis. Ind J Pharmac 1992: 24:181-183.*

9. *Kakar PK, Puri RK, Venkatachelam VP. Oral Submucous Fibrosis-Treatment With Hyalase J Laryngol Otol 1985 an; 99 (1): 57-9*

10. *PindborgJ.J, Pousen H.F., Zachariah J.D., (1967) Oral Epithelial changes in thirty Indians with oral cancer & sub-mucosalfibrosis, Cancer, 20: 1141.*

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